

CLAIMS

1. A fluoropolymer producing method

5 which comprises polymerizing a radical polymerizable monomer in a manner of continuous polymerization in a defined reaction-field to give the fluoropolymer,

wherein said defined reaction-field is in a supercriticality-expression state and under a pressure of not higher than 40 MPa and a temperature of not higher than that
10 higher by 100°C than the supercriticality-expression temperature of the defined reaction-field,

said radical polymerizable monomer comprises a fluorine-containing ethylenic monomer, and

said fluoropolymer has a weight average molecular weight
15 [Mw] of not lower than 150,000 as determined on the polystyrene equivalent basis and

a ratio [Mw/Mn] of the weight average molecular weight [Mw] on the polystyrene equivalent basis to a number average molecular weight [Mn] of the fluoropolymer on the polystyrene
20 equivalent basis is higher than 1 but not higher than 3.

2. A fluoropolymer producing method

which comprises polymerizing a radical polymerizable monomer in a manner of continuous polymerization in a defined
25 reaction-field in the presence of carbon dioxide to give the fluoropolymer,

wherein said defined reaction-field is in a supercriticality-expression state,

said radical polymerizable monomer comprises a
30 fluorine-containing ethylenic monomer,

said carbon dioxide amounts to at most equimolar to said radical polymerizable monomer, and

said fluoropolymer has a weight average molecular weight

[Mw] of not lower than 150,000 as determined on the polystyrene equivalent basis and

a ratio [Mw/Mn] of the weight average molecular weight [Mw] on the polystyrene equivalent basis to a number average molecular weight [Mn] of the fluoropolymer on the polystyrene equivalent basis is higher than 1 but not higher than 3.

3. The fluoropolymer producing method according to claim 2,

10 wherein said defined reaction-field further is under a pressure of not higher than 40 MPa and a temperature of not higher than that higher by 100°C than the supercriticality-expression temperature of said defined reaction-field.

15 4. The fluoropolymer producing method according to claim 1, 2 or 3,

wherein said defined reaction-field has a ratio $[\rho_m/\rho_0]$ of not lower than 1.1, the ratio $[\rho_m/\rho_0]$ is of a monomer density $[\rho_m]$ of a monomer critical density $[\rho_0]$.

20 5. The fluoropolymer producing method according to claim 1, 2, 3 or 4,

wherein the polymerization of the radical polymerizable monomer is carried out in the presence of a chain transfer agent.

25 6. The fluoropolymer producing method according to claim 5,

wherein the continuous polymerization is carried in a condition that an amount of the fluoropolymer in a reaction vessel amounts to at least 8 g per liter of the capacity of said reaction vessel in a steady state.

7. The fluoropolymer producing method according to claim

1, 2, 3, 4, 5 or 6,

wherein the fluorine-containing ethylenic monomer comprises at least one species selected from the group consisting of vinylidene fluoride, tetrafluoroethylene, chlorotrifluoroethylene and hexafluoropropylene.

8. The fluoropolymer producing method according to claim 1, 2, 3, 4, 5 or 6,

wherein the fluorine-containing ethylenic monomer comprises vinylidene fluoride.

9. The fluoropolymer producing method according to claim 1, 2, 3, 4, 5, 6, 7 or 8,

wherein the polymerization of the radical polymerizable monomer is carried out in the presence of a radical polymerization initiator.

10. The fluoropolymer producing method according to claim 9,

wherein the radical polymerization initiator is an organic peroxide.

11. The fluoropolymer producing method according to claim 10,

wherein the organic peroxide comprises a peroxydicarbonate, a fluorine-based diacyl peroxide and/or a fluorine-free diacyl peroxide.

12. The fluoropolymer producing method according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11,

wherein the polymerization of the radical polymerizable monomer is carried out in the presence of a nonethylenic fluorocarbon.